INDEX

	Page
Opinions below	1
Jurisdiction	2
Question presented	2
Statutes involved	2
Statement	2
Specification of Errors	13
Summary of Argument	13
Argument:	
I. If an employee whose duties include the prosecution of inventive work makes an invention in the course of and within the field of such work the patent rights to such invention are the property of the employer	16
II. The employment of Lowell and Dunmore in the Bureau of Standards included the duty to exercise their inventive faculties within the general field to which they were assigned	28
III. Considerations of public policy sustain the contentions of the Government	32
Conclusion	39
Appendix (Statutes)	40–44

CITATIONS

Cases:	
Air Reduction Co. v. *Walker*, 118 Misc. Rep. 827	24
Dalzell v. *Dueber Watch Case Mfg. Co.*, 149 U. S. 315	20
Edisonia Ld. v. *Forse*, 25 Reports of Patent Cases 546	26
Gill v. *United States*, 160 U. S. 426	20, 21
Goodyear Tire & Rubber Co. v. *Miller*, 22 F. (2d) 353	24
Hapgood v. *Hewitt*, 119 U. S. 226	18, 22, 23, 25
Houghton v. *United States*, 23 F. (2d) 386, affirming *United States* v. *Houghton*, 20 F. (2d) 434, certiorari denied, 277 U. S. 592	23, 25, 39
Hoyt v. *Corporon*, 268 Mass. 544	24
Magnetic Mfg. Co. v. *Dings Magnetic Separater Co.*, 16 F. (2d) 739	24
Moffett v. *Fiske*, 51 F. (2d) 868, certiorari denied, 284 U. S. 662	26

Cases—Continued.	Page
Pressed Steel Car Co. v. *Hansen*, 137 Fed. 403	25
St. Louis & O'Fallon Coal Co. v. *Dinwiddie*, 53 F. (2d) 655	26
Solomons v. *United States*, 137 U. S. 342	19, 20, 21, 22, 23, 25, 26
Standard Parts Co. v. *Peck*, 264 U. S. 52, reversing 282 Fed. 443, which reversed 295 Fed. 740	22, 23, 25, 26
Wireless Specialty Apparatus Co. v. *Mica Condenser Co.*, 239 Mass. 158	24, 26
Statutes:	
Act of March 3, 1883, c. 143, 22 Stat. 603, 625	40
Act of March 3, 1901, c. 872, 31 Stat. 1449, 1450 (U. S. C., Title 15, Secs. 271–273, 276)	40
Act of March 4, 1915, c. 141, 38 Stat. 997, 1044	41
Act of July 1, 1916, c. 209, 39 Stat. 262, 324	42
Act of March 4, 1917, c. 180, 39 Stat. 1168, 1169	34
Act of October 6, 1917, c. 79, 40 Stat. 345, 375	42
Act of May 29, 1920, c. 214, 41 Stat. 631, 682, 683, 684	42
Act of March 3, 1921, c. 124, 41 Stat. 1252, 1301	43
Act of March 10, 1928, c. 167, Sec. 3, 45 Stat. 254, 256	34
Act of April 30, 1928, c. 460, 45 Stat. 467, 468	43
Act of June 30, 1932, c. 314, Sec. 312, 47 Stat. 382, 410, (U. S. C. Sup. v, Title 15, Sec. 276)	44

In the Supreme Court of the United States

OCTOBER TERM, 1932

No. 316

THE UNITED STATES OF AMERICA, PETITIONER

v.

DUBILIER CONDENSER CORPORATION

No. 317

THE UNITED STATES OF AMERICA, PETITIONER

v.

DUBILIER CONDENSER CORPORATION

No. 318

THE UNITED STATES OF AMERICA, PETITIONER

v.

DUBILIER CONDENSER CORPORATION

ON WRITS OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT

BRIEF FOR THE UNITED STATES

OPINIONS BELOW

The opinion of the District Court (R. 219) is reported in 49 F. (2d) 306. The opinion of the Cir-

cuit Court of Appeals (R., Vol. II, 462–468) is reported in 59 F. (2d) 381.

JURISDICTION

The judgments of the Circuit Court of Appeals were entered on May 24, 1932. (R. 468.) The petition for certiorari was filed on August 24, and granted on October 17, 1932. (R. 469.) The jurisdiction of this Court rests upon Section 240 (a) of the Judicial Code as amended by the Act of February 13, 1925.

QUESTION PRESENTED

Whether the United States has equitable title to inventions for the improvement of the radio art made by technical research employees of the Bureau of Standards, principally during regular hours of employment, while engaged in research relating to the advancement of the radio art, which was within the scope of their general employment, although they were not specially assigned or directed to devise the particular inventions.

STATUTES INVOLVED

These are set forth in the Appendix, *infra,* pp. 40–44.

STATEMENT

These are three actions in equity to secure an assignment to the United States of the title to three patents which were issued on inventions made by Percival D. Lowell and Francis W. Dunmore in the course of their employment as research workers in

the radio laboratory of the Bureau of Standards. The three bills of complaint are in substance alike, except in their references to the different patents (R. 4–14),[1] and the cases were consolidated for purposes of trial (R. 217). The letters patent involved are No. 1,455,141, issued on May 15, 1923, covering means for eliminating hum from radio receiving apparatus operated by alternating current (R., Vol. II, 10); No. 1,606,212, issued on November 9, 1926, relating to radio loud speakers operated by alternating current (R., Vol. II, 18); and No. 1,635,117, issued on July 5, 1927, relating to radio relays operated by alternating current (R., Vol. II, 1).

The following facts were found by the trial court, or appear to be undisputed:

The Bureau of Standards is a subdivision of the Department of Commerce, and is maintained largely for scientific and engineering research. Although, when originally founded in 1901, the functions conferred upon it consisted principally of the custody, comparison, construction, testing and calibration of standards, and the solution of problems arising in connection with standards (Act of March 3, 1901, c. 872, 31 Stat. 1449, pp. 40–41, *infra*), Congress subsequently, from time to time,

[1] The record in the court below consisted of two volumes. These have been bound together in one volume in the record in this Court, but the original pagination has been preserved. It is thus necessary to identify references to the present record as being either in Volume I or Volume II. Unless otherwise stated, record references are to Volume I.

delegated to the Bureau duties of carrying on technical and engineering research in various branches of science and industry. Development work of this character was conducted at times for other Government Departments, frequently for the general public and on occasion for private industries. (R. 220–221; see Appendix, *infra*, pp. 41, 44.) It has often resulted in original inventions and novel developments of great importance.[2]

The results of original research of the Bureau have from time to time been published in a series of scientific papers, or in outside periodicals. (R. 31–32.) For the purpose of carrying on both its research and its testing work, the Bureau was organized in divisions, which in turn were subdivided into sections, each being devoted to a specific branch of science or industry. (R. 221, 25–28.)[3]

---

[2] An idea of the general extent of the research work of the Bureau of Standards may be gleaned from the following illustrative examples, selected at random, of some of the inventions and developments that originated there: an earth current meter for measuring the intensity of the current discharged from an underground pipe, for the purpose of determining the degree of corrosion due to stray currents from street railways; a machine for testing automobile brake linings; a process for dextrose recovery; a machine for testing elevator interlocks; a signaling system for use by the ordnance department of the Army, utilizing infra-red rays; method for making pots for the melting of optical glass, etc. (R. 30–31.) See also the petition for writs of certiorari, p. 13.

[3] A complete list of the divisions and sections appears in the organization chart (pltf's Ex. 10, R., Vol. II, facing p. 43). The broad scope of the work of the Bureau may be gathered from the names of its principal divisions: Electric-

In view of the rapid growth of radio and its importance in the performance of various Governmental functions, Congress, by one of the appropriation acts for the fiscal year ending June 30, 1916 (Act of March 4, 1915, *infra*, p. 41), appropriated funds to the Bureau of Standards "for investigation and standardization of methods and instruments employed in radio communication." This appropriation has been reenacted annually since that time. Thus, commencing in 1915, the conduct of research work in the radio field in general became one of the duties imposed by law upon the Bureau of Standards.[4]

---

ity, Weights and Measures, Heat and Power, Optics, Chemistry, Mechanics and Sound, Organic and Fibrous Materials, Metallurgy, Clay and Silicate Products. Each of the divisions is subdivided into sections. Thus the Electrical Division consists of ten sections, having the following titles: Resistance Measurements, Inductance and Capacitance, Electrical Instruments, Magnetic Measurements, Photometry, Radio, Underground Corrosion, Safety Standards, Electro-Chemistry and Telephone Standards. Each of the other divisions is similarly subdivided.

[4] For the years involved in this litigation, this provision is found in the Act of May 29, 1920, c. 214, 41 Stat. 631, 682, and in the Act of March 3, 1921, c. 124, 41 Stat. 1252, 1301, 1303. See Appendix, pp. 42, 43, *infra*. In order to facilitate this work, Congress, by the Act of July 1, 1916, c. 209, 39 Stat. 262, 324, and the Act of October 6, 1917, c. 79, 40 Stat. 345, 375, made appropriations for the construction of a fireproof laboratory building to provide additional space for research and testing in radio communication. To enable the Bureau to carry on scientific investigation for other branches of the Government, Congress, by the Act of May 29, 1920, c. 214, 41 Stat. 631, 683, 684, permitted other Departments to transfer funds to the Bureau of Standards for such purposes.

Radio research was conducted in the Radio Section of the Electrical Division, which employed approximately twenty technical research men, as well as a number of draftsmen and mechanics. The technical staff carried on both radio research work and the testing of radio apparatus. (R. 221.)[5]

Among the members of the technical staff were Francis W. Dunmore and Percival D. Lowell. (R. 221.) While the chief of the section selected research problems for the various members of the staff, some of them being frequently suggested by the employees themselves (R. 35), in the very nature of things a considerable amount of work was done by the members of the staff on their own initiative. They considered themselves free, and in fact were expected, to explore any side lines or possibilities suggested by the work in hand.[6]

---

[5] Among the original research projects carried on in the Radio Section during the time in controversy and prior thereto, were the use of alternating current supply, instead of batteries, for radio transmitting apparatus (R. 53); the development of the radio direction finder or compass (R. 193); the development of the radio aircraft beacon (R. 166); and research and standardization of radio devices and methods in general.

[6] Dr. Dellinger, Chief of the Radio Section, testified: "our assignments to all jobs, included offshoots." (R. 123.) Dunmore testified that when he was assigned to a particular task he considered himself at liberty to jump to anything that might occur to him, and had been so trained by his chief, and that, in fact, both he and other research workers at the Bureau frequently got off on side problems. (R. 164–166.) Lowell testified that he worked more or less independently—

In May, 1921, the Bureau of Standards undertook the prosecution of 44 research projects for the Air Corps of the Army, which transferred to the Bureau the necessary funds to pay the cost of the work. The Signal Corps of the Army also allocated certain funds to the Bureau for radio research. One of these problems was the development of a radio relay for use in aircraft, i. e., a mechanism placed in a pilotless airplane or in an aerial torpedo, to receive impulses from a radio apparatus situated on the ground or in another airplane, and in turn to operate the plane or torpedo on which it is placed. (R. 221–222, 188.)

The various projects relating to aircraft radio were assigned to a group within the Radio Section, headed by Dunmore, and the latter selected for himself the task of developing the relay. (R. 222.) His work was successful, and by September, 1921, he had designed the required apparatus. The power for the mechanism was supplied by direct current furnished by batteries. (R. 221–222.)

As the work progressed, a number of possible additional applications for the relay suggested themselves, for which the supply of power by alternating current rather than by direct current appeared more desirable, and in discussions between Mr. Dunmore and his superiors, it was agreed that

did not report to anybody in particular, but just made out his reports and filed them in the office. (R. 196.) Lowell also at times worked on side problems. (R. 166.)

this feature of the work should also be prosecuted. (R. 51, 112, 119–131, 140; Vol. II, 333–334, 336–339, 342, 345.)[7] The Bureau had been interested in investigating problems arising out of the use of alternating current in radio, which at that time was in its infancy. Thus, it had developed a transmitter so operated. (R. 52–53.)

By December, 1921, the alternating current relay was completed and later Dunmore constructed several such machines for use by the Army and Navy. (R. 223.)[8] This device is covered by Patent No. 1,635,117, dated July 5, 1927, one of the patents in suit.

In the midst of these problems—and, it may fairly be assumed, as a result of his experiments in connection with the use of alternating current in the operation of a relay—the thought occurred to Dunmore of using the ordinary 60-cycle alternating house current for the operation of a radio receiving set. Impelled by his scientific curiosity, as the court found (R. 222), Dunmore constructed and experimented with apparatus which he designed in the laboratory of the Bureau for this purpose. These efforts eventuated in the invention which is covered by Patent No. 1,455,141, dated May 15,

[7] While the trial court does not make such a finding, Dr. Dellinger's evidence to that effect is not contradicted.

[8] Both the record and the opinion of the trial court refer to the alternating current relay as "Type B" relay, to distinguish it from the direct current relay which was referred to as "Type A" relay.

1923, and which, as the trial court found, was reduced to practice on December 10, 1921 (R. 223).

His experiments continued, as his and Lowell's notebooks and reports disclose (R., Vol. II, 122–128, 163–165, 248–273, 339–342, 344, 345, 352–355), and during the following January Dunmore and Lowell set up a dynamic loud speaker operated by the ordinary house current instead of batteries, in conjunction with a receiving set similarly operated. This appears from Lowell's notes of January 23, 1922 (R., Vol. II, 165, 271, 355), the device in question being made the basis of Patent No. 1,606,212, dated November 9, 1926.[9]

During the progress of Dunmore's work with Lowell, from the development of a direct current relay for use in an aeroplane through the development of a similar relay actuated by alternating current and the application of alternating current to a radio receiving set and its loud-speaker, both Dunmore and Lowell were conferring with their superiors and reporting, in their notebooks and monthly reports, the progress of their work. After the first few conferences in reference to the problems which they were attempting to solve, Lowell submitted to his chief a memorandum of his work, and on or about January 10, 1922, received definite instructions to undertake the development of an

[9] This invention was completed and reduced to practice on January 25, 1922—after the development of the application of alternating current to receiving apparatus was specifically asigned to Lowell as a problem. (R. 224.)

alternating current receiving set. (R. 223–224, 55–56; Vol. II, 96–102.) A large part of their time for several months thereafter was devoted to the development and perfection of the very crude and imperfect apparatus which was the basis of their early laboratory experiments. (R. 224, 70–89, 92, 96–99; Vol. II, 163–189, 247–322, 351–360.)[10]

In all of this work, Lowell and Dunmore received the cooperation of other members of the technical staff (R. 71–72), as well as whatever assistance was required from Government draftsmen and other laboratory employees (R. 224, 66, 69, 137–141, 175). Government material was requisitioned and used in building the various appliances. (R. 169, 224; Vol. II, 398.)

In doing the research work leading up to the inventions in suit Dunmore and Lowell were merely following the instructions of their superiors to develop their discoveries to the point of useful application, even if such developments did not relate to the immediate problem in hand. (R. 125, 164–165, 196. See footnote 6, page 6, *supra*.) The inventions covered by the patents in suit eventuated

[10] It was the contention of the Government at the trial and in the Circuit Court of Appeals that the work of December 10, 1921 (R. 223), was purely a preliminary experiment and that the invention covered by Patent No. 1,455,141 was actually made not earlier than January 20, 1922, i. e., after the chief of the Radio Section formally assigned the task to Lowell. The court found, however, that the invention had been reduced to practice on December 10, 1921, i. e., prior to the formal assignment.

from the natural development of the work they were required to do in the performance of their duties.[11]

The progress of the work was recorded from time to time in Lowell's and Dunmore's weekly and monthly reports and laboratory notebooks, which they were required to keep and file with their superiors as part of the official records of the Bureau. (R. 42–43, 58–99; Vol. II, 103, 360.) The development of the alternating current receiving set and loud speaker was described in one of the scientific papers of the Bureau of Standards, after approval by the chief of the Bureau and its editorial committee (R. 224), while the work on the relay was described as a Bureau of Standards output by similar permission, in an outside scientific journal (R. 100–105; Vol. II, pp. 361–376). There is no question, therefore, that during the prosecution of the work, both Lowell and Dunmore on the one hand, and the officials of the Bureau of Standards on the other, considered that it was comprised within the duties of the two inventors as Government employes.[12]

---

[11] There is no finding to this effect, nor any to the contrary. The evidence, however, is undisputed.

[12] This strikingly appears from the draft of a letter which Dunmore prepared for the signature of his chief in response to an inquiry from a manufacturer regarding the relay. In this letter he stated: "We wish to advise that an unfortunate situation has arisen in connection with this relay in that the Bureau member who developed it applied for letters patent on same, *against the policy of this Bureau.*" (R. 183–184; Vol. II, pp. 411–412.) In an article which Dunmore wrote

Early in 1922 Lowell and Dunmore, without the knowledge of their superiors, filed applications for patents on the three developments above discussed. (R. 223–224, 105–106.) In June, 1922, the chief of the Radio Section informed the inventors that it was desired that applications for patents be filed through Bureau channels, and received the reply that applications had previously been filed privately. (R. 105–106.) Formal demands for assignment of the applications to the United States followed immediately, but met with a refusal. (R. 224.) The applications eventuated into patents and, thereafter, exclusive licenses under them were granted to the respondent. (R. 224–225.)

The District Court dismissed the bills of complaint on two grounds: first, that there was no specific assignment or direction to Lowell and Dunmore on the part of their superiors to make the inventions; second, that, as a matter of public policy, not to permit Government employees under the present circumstances to retain the property rights to their inventions would take away from them an incentive to make inventions and would crush inventive genius. The Circuit Court of Appeals affirmed the decrees on the ground first stated, as well as on the ground that the conduct of research work did not involve the making of inventions and that consequently the making of inventions was no part of the duties of the patentees.

---

for the "Electrical World" he stated that "The Bureau of Standards has developed a relay." (R. 176, Vol. II, 407.)

SPECIFICATION OF ERRORS

The Circuit Court of Appeals erred:

(1) In holding that an employer does not acquire title to the patent covering an employee's invention in the absence of a specific assignment or direction to make the invention, although one of the duties of the employment was to carry on research and inventive work in a specified field, the invention was made within such field, the work was carried on at the employer's place of business during the regular hours of employment, and materials and equipment owned by the employer were used and consumed in making the invention.

(2) In affirming the decrees of the District Court.

SUMMARY OF ARGUMENT

I

This Court has held that if one is expressly hired for the purpose of making a specific invention, or is designated or directed to develop such invention, the patent rights arising out of such invention become the property of the employer. The *ratio decidendi* of this holding is that in making the invention the employee is merely doing what he was hired to do, having contracted in advance for the performance of work of an inventive character, and therefore the fruits of his work belong to the employer.

The same result should follow if an employee, instead of being hired or being assigned to make a

specific invention, is hired for the purpose of doing inventive work in a particular field. If in such event the employee makes an invention within that field, he has only done that which he was hired to do and accordingly the patent rights to such invention are the property of the employer.

II

The employment of Lowell and Dunmore included the duty to exercise their inventive faculties within the general field to which they were assigned. It is not disputed that they were in the actual performance of their employment while engaged in the research which led to the inventions in question. Their duties were not confined to the solution of specially designated problems, but they were expected to and did follow " leads " uncovered during the progress of their work. The inventions in question represented a natural and progressive development of the work which they were pursuing under the direction of their superiors, and which they systematically described in their official reports.

Essentially the purpose of industrial research is to apply to industry the discoveries of science. When one is employed for scientific research to meet the needs of a rapidly advancing industrial art, such as radio, his employment necessarily includes the duty to employ his talent in devising new and useful appliances for the improvement of the art.

If, in this process, discovery and application to useful purposes rise to the level of invention, the invention is the fruit of the employment.

There is no basis for the holding that because "research" and "invention" are not synonymous, the research work of Lowell and Dunmore did not include the duty to make inventions. The research work in which they were engaged had for its express purpose the improvement of the radio art by invention.

III

In the efficient conduct of modern research laboratories it is necessary to permit scientists to exercise initiative and freedom in the solution of particular problems and in following suggestions or leads arising out of a specific task. Discoveries and inventions seldom can be anticipated and, hence, it is often impossible to assign the development of a particular invention as a task to be performed.

Research work regularly resulting in numerous inventions is continually being carried on in laboratories conducted by Governmental agencies. It is against public interest that private individuals should collect royalties for the use of inventions developed at public cost.

The rule adopted by the courts below, if allowed to stand, would tend to demoralize the Bureau of Standards as a center for scientific and industrial research. The experience of private industry

148671—32——3

shows that invention is not discouraged where the employer retains property rights to the inventions of employees engaged in inventive work.

The Act of March 3, 1883, as amended by the Act of April 30, 1928, does not express the entire Governmental policy with regard to patent rights on inventions of Government employees. Its obvious purpose was to accord the privilege of obtaining patents without charge to Government employees who might make an invention under circumstances under which the Government would have neither title to the patent nor a license under it.

ARGUMENT

I

IF AN EMPLOYEE WHOSE DUTIES INCLUDE THE PROSECUTION OF INVENTIVE WORK MAKES AN INVENTION IN THE COURSE OF AND WITHIN THE FIELD OF SUCH WORK THE PATENT RIGHTS TO SUCH INVENTION ARE THE PROPERTY OF THE EMPLOYER

The title, as between employer and employee, to an invention made by the employee depends principally upon the terms of the employment. If the contract of hire expressly provides that the employee's inventions shall be the property of the employer, the latter, of course, becomes the equitable owner of such inventions as are within the scope of the agreement. In the absence of express provision the law may imply such an agreement by reason of the relationship between the parties and the circumstances under which the invention is perfected. The ultimate question before the Court is

whether such an agreement may be implied in the instant case.

Inventions made by an employee whose contract of hire contains no express provisions with respect to ownership of inventions may be divided into the following categories:

1. Inventions having no relation to the employee's duties and made outside of office hours. In such instances the invention is the property of the employee and the employer has no interest in it.

2. Inventions arising out of or incidental to the employee's duties and made by an employee whose duties do not include the conduct of research and inventive work. Here the employee retains title to the patents but the employer is entitled to a shop right or nonexclusive license.

3. Inventions made by an employee in connection with and within the scope of his work, where his duties include the carrying on of research and inventive work. This class of cases may be further subdivided as follows:

(a) Where the employee was specifically assigned to the task of making the invention. In such cases the entire property rights to the invention vest in the employer. (See cases cited *infra*.)

(b) Where the duties of the employee include research and invention in a specified field, and an invention perfected lies within that field, but the employee was not expressly assigned to develop the particular device. The rule applicable to the preceding subclass should also, we submit, govern this

group of cases since the underlying principle is the same.

It is our contention that the facts as found by the trial court show clearly that the duties of Lowell and Dunmore as research physicists in the radio section of the electrical division of the Bureau of Standards included the duty to make inventions within the radio field. This question, which is essentially one of fact, will be discussed later. For immediate purposes we assume that such a duty existed and confine our argument to the question whether, as a matter of law, the United States is entitled to ownership of the patents in suit despite the fact that Lowell and Dunmore were not specifically directed to make the particular inventions covered by their patents.

The question of title to patents on inventions of employees first came before this Court in *Hapgood* v. *Hewitt,* 119 U. S. 226. A corporation engaged in the manufacture of plows had hired Hewitt as superintendent of its manufacturing department. In the course of his work he developed and patented a new type of frame for one of the plows which the company was producing. A suit in equity was brought by the trustees of the corporation, the company itself having been dissolved, to compel Hewitt to assign the patent. A demurrer to the bill was sustained on the ground that the allegations were not sufficient to establish that the contract of employment required the employee to exercise his inventive faculties. The decision is therefore not an

authority for the proposition, for which it has at times been cited, that an employer never acquires title to patents on his employee's inventions in the absence of an express agreement.

The next case in which the question was considered by this Court was *Solomons* v. *United States*, 137 U. S. 342. There it was found as a fact that the employee was expressly directed to devise a new type of revenue stamp. He succeeded in doing so, obtained a patent, and assigned the patent to the plaintiff. This Court held that the plaintiff was not entitled to recover for the use of the invention by the Government, basing its decision on two grounds: first, that since the making of the invention was one of the duties of the employee the patent rights became the property of the Government; second, that in view of the fact that the invention was made in the course of the employment at the expense of the employer and with the use of employer's machinery and the employee expressly assented to the use of the invention by the Government, the latter had an irrevocable license to use the device. With respect to the first ground this Court formulated the rule as follows (p. 346):

> If one is employed to devise or perfect an instrument, or a means for accomplishing a prescribed result, he can not, after successfully accomplishing the work for which he was employed, plead title thereto as against his employer. That which he has been employed and paid to accomplish becomes, when accomplished, the property of his employer.

> Whatever rights as an individual he may have had in and to his inventive powers and that which they are able to accomplish, he has sold in advance to his employer.[13]

In *Dalzell* v. *Dueber Watch Case Manufacturing Co.*, 149 U. S. 315, the employee was a mechanic whose duties were not shown to have included the making of inventions. In the course of his employment he invented and patented tools for fabricating parts of watch cases. In a suit for infringement the employer pleaded an oral agreement by which the employee covenanted to convey to the employer the patents on any inventions that he might make. This Court held that the existence of such a contract was not proved and that the plea to the bill for infringement should be overruled. It is clear that the case does not detract from or limit the rule previously laid down in the *Solomons case*, but merely enforces the well-established principle that where an employee is not required to do inventive work title to patents on his invention does not pass to the employer in the absence of an express contract.

The *Solomons case* was again discussed in *Gill* v. *United States*, 160 U. S. 426. There also the duties of the employee did not include inventive work and the invention in suit was conceived and perfected

[13] It has been at times asserted that the quoted statement should be regarded as an *obiter dictum*. The subsequent decisions of this Court which are discussed *infra* show that this assertion is unwarranted.

outside of office hours. But with the permission of his superiors the inventor, a Government employee, constructed several machines at Government expense and in working hours. This Court held, largely on the authority of the *Solomons case*, that he was not entitled to recover compensation for the use of the machines. The following statement was made (pp. 435–436):

> * * * if the patentee be employed to invent or devise such improvements his patents obtained therefor belong to his employer, since in making such improvements he is merely doing what he was hired to do. Indeed, the *Solomons case* might have been decided wholly upon that ground, irrespective of the question of estoppel, since the finding was that Clark had been assigned the duty of devising a stamp, and it was understood by everybody that the scheme would proceed upon the assumption that the best stamp which he could devise would be adopted and made a part of the revised scheme. * * * In fact, he was employed and paid to do the very thing which he did, viz, to devise an improved stamp, and, having been employed for that purpose, the fruits of his inventive skill belonged as much to his employer as would the fruits of his mechanical skill.[14]

[14] The Court points out in its opinion that it is immaterial whether the time or property of the employer is used in originally conceiving and developing the idea or whether, as was the fact in the *Gill case*, it is used only later in the

The latest applicable decision of this Court is *Standard Parts Company* v. *Peck*, 264 U. S. 52. In that case there was an express contract to develop a process for the production of certain types of springs. The plaintiff developed and patented a device for that purpose and built four machines embodying his invention. The Standard Parts Company, successor to the original employer, made and used certain additional machines. The plaintiff brought suit for infringement and the defendant counterclaimed, demanding an assignment of the patent. The District Court, expressly relying on the *Solomons case*, rendered a decree for the defendant on the counterclaim, *Peck* v. *Standard Parts Company*, 295 Fed. 740 (N. D. Ohio). The Circuit Court of Appeals for the Sixth Circuit reversed the decree (282 Fed. 443), stating that the rule of the *Solomons case* was merely a dictum and relying on a broad construction of *Hapgood* v. *Hewitt*, 119 U. S. 226, *supra*. It is significant that the Circuit Court of Appeals considered that a contract to devise one specific improvement should not be treated any differently from a contract to devise

---

preparation of patterns and working drawings in the construction of the completed machines (pp. 433–434), holding that the rights of the employer are the same in either event. It is submitted that this is significant in the instant case in connection with the question whether the inventions in suit were actually completed before or after they became specifically assigned tasks. Under the ruling of the *Gill* case this question would seem to be immaterial.

improvements of a specified class. It reached the wrong conclusion, however, by interpreting the *Hapgood case* as holding that where an employee is hired to devise improvements of a specified class, the propety rights to his invention do not vest in the employer. This Court, in reversing the decree of the Circuit Court of Appeals, said (p. 59):

> It is going very far to say that the declaration of *Solomons* v. *United States,* repeated in subsequent cases, and apparently constituting their grounds of decision, may be put aside or underrated—assigned the inconsequence of dicta. It might be said that there is persuasion in the repetition.[15]

Houghton v. *United States,* 23 F. (2d) 386 (C. C. A. 4th), affirming *United States* v. *Houghton,* 20 F. (2d) 434 (Md.), certiorari denied, 277 U. S. 592, was an action brought by the United States against a chemist employed by the Public Health Service, to compel him to assign to the Government a patent on a fumigant gas invented by him pursuant to the express directions of his superiors. It was held that the Government was entitled to the patent, both courts relying on the *Solomons* and *Standard Parts Company cases.* The Circuit Court of Appeals distinguished be-

[15] In the case at bar the Circuit Court of Appeals fell into the very error warned against, namely, assigning to the declaration of the *Solomons case* the "inconsequence of dicta." (R. 466, 467.)

tween duties imposed upon an employee by the original contract of hire and those which he may assume during the course of the employment, saying that it is the services in which he is engaged at the time of making the invention which are determinative of the ownership of the invention. It is significant that the court refused to ascribe any legal effect to the actual understanding and intentions of the employee and his superiors in the Public Health Service, holding, in substance, that the rights of the Government arose by operation of law from the relations between employer and employee, and that no officer of the Government had authority to contract away rights thus created in it.

It is clear, from the authorities discussed above, that where an employee is employed to invent, any invention that he makes in the field of such employment is the property of his employer. This rule has been followed in the Federal courts and is the accepted doctrine in a number of the States, as well as in England. *Magnetic Manufacturing Company* v. *Dings Magnetic Separator Company,* 16 F. (2d) 739 (C. C. A. 7th); *Goodyear Tire & Rubber Company* v. *Miller,* 22 F. (2d) 353, 356 (C. C. A. 9th); *Wireless Specialty Apparatus Company* v. *Mica Condenser Company,* 239 Mass. 158; *Hoyt* v. *Corporon,* 268 Mass. 544; *Air Reduction Company* v. *Walker,* 118 Misc. Rep. 827.[16]

[16] Although the case last cited is a *nisi prius* decision, it has been several times referred to with approval by other courts.

Pressed Steel Car Company v. *Hansen,* 137 Fed. 403 (C. C. A. 3d), has been cited as an authority to the contrary. That case is based on a narrow interpretation of the *Solomons case*—the very interpretation which this Court repudiated in the *Standard Parts case* (see p. 23, *supra*)—and on an unwarranted construction of the *Hapgood case.* It is submitted that the dissenting opinion contains the better reasoning.

Because it happened, in the *Solomons, Standard Parts,* and *Houghton cases,* that the patentee's duties at the time of the invention consisted in performing a single specified inventive task, the courts below in the case at bar have limited the doctrine underlying those cases to situations where the particular problem solved by the invention is specifically assigned to the employee. This limitation, we think, is predicated upon a misunderstanding of the principle upon which the rights of the parties must depend. The decisions of this Court rest upon the fundamental proposition that in each instance the employee was hired to invent, and that, therefore, in making the invention he was doing what he was hired to do. Consequently, the product of his labor, i. e., the invention and the patent rights arising out of it, became the property of the employer. It is clearly immaterial whether an employee is hired to make a single invention or to make inventions generally in a specified field. In the latter situation, if he makes one or more inven-

tions, he does precisely what he was hired to do. The fallacy of attempting to confine the application of the *Solomons* and *Standard Parts cases* to situations where the employee is expressly directed to make a specific invention is clearly pointed out by the Circuit Court of Appeals in *Peck* v. *Standard Parts Company,* 282 Fed. 443, 447, *supra.* The same rule must necessarily govern an employment to do inventive work for the advancement of a particular art or in a specified field, for in such event any invention made by the employee in that field is the product of what he was hired to do.

This principle has been recognized and applied on several occasions. *St. Louis & O'Fallon Coal Co.* v. *Dinwiddie,* 53 F. (2d) 655 (Md.)[17]; *Wireless Specialty Apparatus Co.* v. *Mica Condenser Co.,* 239 Mass. 158. See *Moffett* v. *Fiske,* 51 F. (2d) 868 (App. D. C.), certiorari denied, 284 U. S. 662.

The contention which prevailed in the courts below in the instant case was advanced in England in the Chancery Division of the High Court of Justice, and disposed of adversely. *Edisonia Ld.* v. *Forse,* 25 Reports of Patent Cases, 546. The plaintiff was a manufacturer of phonographs and cylindrical records. The defendant was the manager of its molding department, and *inter alia* was charged with the duty of perfecting the manufacture of cylinders by a molding process instead of by en-

[17] It is understood that an appeal from this decision is now pending in the Circuit Court of Appeals for the Fourth Circuit

graving. He developed two patentable improvements, only one of which the plaintiff found useful. An action was successfully brought to compel him to assign both patents. The court made the following statement with reference to the question here involved (p. 551):

> The conclusion to which I have come on the facts is, that the Defendant was expressly or impliedly, from the time he became the manager of that moulding department, directed to do the best he could with the view of improving the mode of sale and manufacture of these cylinders. * * * That being so *there would be no necessity for any special direction* in this particular case. (Italics ours.)

In commenting upon the second patent, the court stated that it was immaterial that the invention occurred to the defendant without any express instructions to devise an improvement of that kind.

In the case at bar, the prosecution of research and development work for the purpose of improving the radio art, or, more specifically, the methods and instruments employed in radio communication, was, as we shall attempt to show later, comprised within the duties of the two inventors. Consequently, when they made patentable inventions within that field, they did exactly what they were hired to do, and the law will imply an agreement that the patents covering such inventions should be the property of the United States.

II

THE EMPLOYMENT OF LOWELL AND DUNMORE IN THE BUREAU OF STANDARDS INCLUDED THE DUTY TO EXERCISE THEIR INVENTIVE FACULTIES WITHIN THE GENERAL FIELD TO WHICH THEY WERE ASSIGNED

There can be no dispute upon this record, and there is no finding to the contrary, that Lowell and Dunmore, the patentees, were in the actual performance of their employment while engaged in research which led to the discovery and reduction to practice of the inventions for which they obtained patents. They were employed for such work, were engaged in devising new and useful improvements for the advancement of the art of radio transmission and reception, and recorded their work in the official records of the Bureau. (R. 34, 35, 42, 58 *et seq.* 123, 164–166, 196–197.) Their duties were not confined by agreement or instruction to the solution of particular problems in this art. (R. 123, 196.) Dunmore was employed as an associate physicist, and was in charge of a group of assistants in the radio section engaged in the solution of problems involving the use of radio. (R. 222.) Lowell was an independent worker. (R. 196.) Each was a trained physicist, employed in the solution of problems some of which, at least, required invention, and each was under instructions to follow any leads developed in the course of his work (R. 123), which obviously meant the development of discoveries to the point of useful application,

which is invention. The research work in which they were engaged necessarily involved invention, if its purpose was to be accomplished.

Ignoring the fact that decision must turn upon the character of the individual employment and the purpose of the hiring, both courts below were content to rest decision upon the abstract meaning of the word "research" as contrasted with "invention." Of course there may be research which does not involve invention, but such abstractions do not approach conclusion upon the rights of the parties to this litigation. The fact is that the research in which these men were engaged, had for its purpose improvements in the art of radio transmission and reception and was undertaken to improve the art by invention. We submit, therefore, that both Dunmore and Lowell were hired to make inventions.[18]

Primarily, industrial research aims to apply to industry the discoveries of science, and the purpose of such research is to advance the industrial arts. Consequently, when one is employed in scientific research to improve a rapidly advancing industrial art his employment necessarily includes the duty to utilize his talent in devising new and useful processes and appliances for the improvement and advancement of the art. If, in this process, discovery

[18] It is, of course, unnecessary to show that all research in the Bureau of Standards is undertaken for the purpose of improving an art by invention. It is enough that research in the radio art was clearly undertaken for this purpose.

and application to useful purposes rise to the level of invention, the invention is the fruit of the employment. When the purpose of the employment requires the exercise of talent of the highest degree in the application of the discoveries of science to the improvement of the useful arts, the duty to exercise such talent must be implied, particularly when in the course of the employment such talent is constantly used. In such employment the employee is employed and paid to make inventions and his inventions made in the pursuit of his employment become the property of his employer.

Research scientists engaged in industrial research are employed, whether by the Government or by commercial laboratories, in the expectation that they will advance the industrial arts by their development of inventions which will be of value. Such employment is undertaken not for the investigation of abstract principles of pure science but for the very practical purpose of advancing the arts which are useful in carrying on the functions of industry and commerce, or of government. This is strikingly true of research in the radio art, which was in 1921, and still is, undergoing amazing development of the greatest importance to industry and to government as well. The intention of Congress that the Bureau of Standards should carry on such research for the benefit not only of other Departments of the Government but in the general development of the industrial arts, is entirely clear from

the Appropriation Acts which have been passed in connection with the conduct of such research (see Appendix, infra, pp. 41, 44; see also U. S. C., Title 15, Sec. 276) and from the continued practice of the Bureau in conducting such research for commercial and industrial organizations.[19]

It is clear, therefore, that employment in the research work of the Bureau of Standards in the radio field necessarily includes the duty to exercise one's inventive faculty in the improvement of the radio art. That Lowell and Dunmore so understood their duty appears clearly from the fact that they devoted a large proportion of their official time to such work and regularly noted it in their office reports and memoranda. Conclusion therefore follows that when Lowell and Dunmore were engaged in such research, from which the inventions in question resulted, they were doing precisely what they were hired to do, namely, employing their inventive talents for the improvement of the radio art.

---

[19] For an enumeration of some of the radio inventions emanating from the Bureau of Standards, see footnote 5, *supra*, p. 6. Dunmore himself testified that he was engaged in work of an important nature, adding: "By important nature I mean in contradistinction to most of the work of the laboratory, which was of a routine nature, to that of the more interesting type of work of a development nature." (R. 163.) He stated that half of his time was devoted to work of a development nature, and also said that research and development can be construed as about the same. (R. 164.)

III

CONSIDERATIONS OF PUBLIC POLICY SUSTAIN THE CONTENTIONS OF THE GOVERNMENT

Were the decision of the Circuit Court of Appeals to stand, incongruous and unjust results would frequently be found. A person in a subordinate position whose activities are strictly limited to expressly designated tasks would be required to convey to his employer any invention that he makes. On the other hand, an employee higher up in the scale, in a more responsible and remunerative position, who is allowed to work to a certain extent on his own initiative, would be permitted to retain the fruits of his inventive genius. The same rule should be applicable to both classes of cases.

The successful conduct of research for the improvement of the electrical arts requires that the scientists engaged in such research should be permitted to exercise initiative and freedom in the solution of particular problems and in following suggestions or implications arising out of the task in hand. Otherwise many paths leading to discovery and invention would never be explored.[20]

---

[20] This was clearly Dunmore's conception of the type of research in which he was engaged. He testified: "I often got off on little side problems, since anyone engaged in research work will tell you when working on one problem others are presented. When such others were presented and occurred to me and Lowell too, * * * we would switch off occasionally and tackle these problems sufficiently to see if they were worth going into in greater detail. * * * While it might interfere somewhat with the assigned prob-

Discoveries and inventions can not always be anticipated. They are frequently developed not through the assignments to particular problems but by unanticipated discoveries of useful application. Such results are the fruits of research in the useful arts and were the objectives of the work in which Dunmore and Lowell were engaged regardless of the particular problems upon which they were working.[21]

The question of ownership of patent rights to inventions developed in Government laboratories is of great importance, since original research work frequently resulting in inventions is continually being carried on, not only at the Bureau of Standards, but also in other laboratories maintained by Governmental agencies at public expense.[22] It is contrary to public interest that private individuals should collect royalties for the use of inventions developed at public cost.

It is argued that the strictly Governmental needs may be satisfied by a nonexclusive license to use the invention. This contention ignores the true sig-

---

lem, the result in many cases more than justified it since it was these little side problems that oftentimes developed into the big main problem later on." (R. 164.)

[21] Dunmore gave an illustration of such a situation: "Mr. Lowell was working on a cross-coil direction finder, and he probably spent half an hour on a couple of coils and made a test which is the basic invention involved in the present-day radio beacon, guiding mail planes." (R. 166.)

[22] A partial list of Governmental agencies conducting scientific, engineering, and industrial research is found in Appendix A to the petition for certiorari, pp. 16–18.

nificance of the possible outcome of such a policy. Many such inventions are of vast importance to the nation at large, while their Governmental uses, if any, may be very circumscribed.[23] It is not consonant with public policy that the right to use such an invention should be controlled by an individual and that it should become a source of income either to him or to some commercial concern to whom he may elect to convey the patent rights, when the invention itself was made at a laboratory maintained at Government expense, with the use of its equipment, by a person whose services were employed by the Government for the advancement of the art. Such inventions should be controlled by the Government in the public interest. If it is proper that they should become a source of income, the royalties or license fees should accrue to the Treasury; or, if it is deemed wise that the general public should be free to utilize them, Congress should have the opportunity to provide for their dedication to public use.[24]

---

[23] A striking illustration is the remedy for hog cholera developed at the Department of Agriculture.

[24] The court will take judicial notice of the fact that the Government frequently acquires ownership of patents. For example, funds are frequently being appropriated to the various Departments for the purchase of patent rights (cf. Act of March 4, 1917, 39 Stat. 1168, 1169); during the World War, the Alien Property Custodian assigned to the United States a number of patents seized from enemy aliens (see Settlement of War Claims Act of 1928, Sec. 3, subsec. (b), par. 3, Act of March 10, 1928, 45 Stat. 254, 256).

We believe that an affirmance of the decrees below would have a demoralizing effect upon and impair the usefulness of the Bureau of Standards. If each member of its technical staff were free to take out private patents on inventions made by him in the course of his work, he would be under constant temptation to neglect tasks specifically assigned to him, to give as narrow a scope as possible to the work to which he was expressly detailed and to look for possible subject-matter for independent research that might lead to inventions resulting in lucrative emoluments to himself. Each research worker would be placed in the position of serving two masters. Instead of being an effective instrument for scientific research carried on in the public interest, the Bureau would tend to become a central laboratory at which scientists and engineers might carry on research for personal profit without cost to themselves and with salaries paid by the Government.

Some of the important research work carried on at the Bureau is conducted in cooperation with and for the benefit of private industries and trade associations, the latter frequently contributing to the cost of the projects. (See Report of the Bureau of Standards for 1922, Def.'s Ex. 14, filed with the Clerk.)[25] Were the results of such

[25] The Act of March 3, 1901, c. 872, 31 Stat. 1450, as amended (U. S. C., Title 15, Sec. 276), pp. 40–41, *infra*, authorized the Bureau to accept reasonable fees for all comparisons, tests, or investigations performed by the Bureau for private industrial concerns. By the Act of June 30,

research to become the subject of private patents to be held by Bureau employes, persons contributing to the cost of the work of the Bureau would often be compelled to pay royalties for the use of inventions perfected partly at their expense, with the result that this valuable type of Bureau activity would be gradually discontinued. The confidence which scientific societies, trade associations, and industrial concerns have always imposed in the Bureau would necessarily be impaired if their problems submitted to the Bureau should find solution in inventions covered by patents issued to employees of the Bureau.

The trial court was evidently misled by a feeling of sympathy for the employee. But there is another side to the picture. Were it not for the years of training and experience which the employee receives at the laboratory;[26] were it not for the op-

1932, c. 314, 47 Stat. 410 (U. S. C. Sup. V, Title 15, sec. 276), p. 44, *infra*, the statute was amended so as to provide that the Bureau should charge a fee sufficient to compensate it for the entire cost of the services rendered.

[26] For example, Lowell first came to the Bureau as a laboratory apprentice in 1913 and was regularly promoted from time to time until he reached the position of Associate Physicist, which he occupied at the time he made the inventions here involved. (R., Vol. II, pp. 444–445.) Similarly, Dunmore came to the Bureau early in 1918 as a laboratory assistant and was likewise promoted at regular intervals until he attained the position of Associate Physicist, which he occupied at the time of the invention. Since that time his promotions have continued at stated intervals. (R., Vol. II, 425.)

portunity accorded to him for doing original research work in an established laboratory with its costly equipment and requisite material and with the assistance of necessary mechanics and draftsmen; were it not for the fact that he is paid a salary and thus left free to devote his time to scientific research; the invention might never have been made. On the other hand, the employer assumes the risk of financial loss, if, as happens in the great majority of cases, the employee's work should turn out to be unproductive.

The trial court also suggests that the failure to permit research workers of the Bureau to secure patents on their inventions "would measurably crush the inventive genius, enthusiasm, and spirit of the employees." (R. 230.) The experience of private industry demonstrates the contrary. Large industrial and public-utility corporations maintain research laboratories employing staffs of original-research workers. Invariably the patents on inventions emanating from the laboratory become the property of the employer, and it is well known that in order to eliminate controversy and litigation such corporations usually require express contracts from their research workers to assign to the employer the patent rights to their inventions. So far as we are aware, it has never been successfully contended that this practice of modern industry has resulted in the crushing or hampering of inventive genius. Some of the outstanding in-

ventions of the present era are the product of industrial laboratories.[27]

The respondent contends that by the Act of March 3, 1883, as amended by the Act of April 30, 1928, *infra,* pp. 40, 43–44, Congress has expressed the policy of the Government as exacting only non-exclusive licenses on the inventions of its employees. We submit that this argument is founded upon a misconception of the statute.

The Act of March 3, 1883, in effect authorizes the Commissioner of Patents to grant a patent to any Government employee without the payment of any fee, when such invention is used or is liable to be used in the public interest; provided that the applicant grants to the Government a non-exclusive license to use the invention.[28] In endeavoring to ascertain the purpose of Congress in enacting this statute, it must be borne in mind that among the many Government employees there have always been persons who make inventions. Frequently such inventions are made largely or entirely outside of office hours and have no connection with the employee's official duties. Obviously, the Govern-

[27] Examples in support of this statement may be found in the far-reaching inventions in the telephone field, in the explosive and chemical industries, in the automotive industry and its allied branches, and in the electrical and radio field. For an illuminating discussion of this tendency, see Encyclopedia Britannica (14th Ed.), Vol. 19, p. 204, Art. "Research. Industrial."

[28] The 1928 amendment deals with a point not material to this discussion. (See p. 44, *infra.*)

ment would have no interest in or right to use such inventions. The manifest object of the statute was to extend to such inventors the facilities of the Patent Office without charge, if, in exchange for a waiver of Patent Office fees, they consented to grant to the Government a nonexclusive license. Clearly, as said by the District Court in the *Houghton case, supra* (20 F. (2d) 434, 437), it could not have been the intendment of the Act to surrender the rights of the Government to inventions which it would otherwise own. Had that been the purpose of Congress, it is fair to assume that it would have been unequivocally set forth.

CONCLUSION

The decision of the Circuit Court of Appeals should be reversed and the cases remanded to the District Court with instructions to enter decrees for the petitioner.

Respectfully submitted.

THOMAS D. THACHER,
Solicitor General.
CHARLES B. RUGG,
Assistant Attorney General.
ALEXANDER HOLTZOFF,
Special Assistant to the Attorney General.
PAUL D. MILLER,
H. BRIAN HOLLAND,
Attorneys.

DECEMBER, 1932.

APPENDIX

STATUTES

The sundry civil appropriation act of March 3, 1883, c. 143, 22 Stat. 603, 625, provided in part:

> The Secretary of the Interior and the Commissioner of Patents are authorized to grant any officer of the government, except officers and employees of the Patent Office, a patent for any invention of the classes mentioned in section forty eight hundred and eighty six of the Revised Statutes, when such invention is used or to be used in the public service, without the payment of any fee: *Provided,* That the applicant in his application shall state that the invention described therein, if patented, may be used by the government or any of its officers or employees in the prosecution of work for the government, or by any other person in the United States, without the payment to him of any royalty thereon, which stipulation shall be included in the patent.

The act of March 3, 1901, c. 872, 31 Stat. 1449, 1450 (U. S. C., Title 15, Secs. 271–273, 276) creating the Bureau of Standards, provided as follows:

> That the Office of Standard Weights and Measures shall hereafter be known as the National Bureau of Standards.
>
> SEC. 2. That the functions of the bureau shall consist in the custody of the standards; the comparison of the standards used in scientific investigations, engineering, manufacturing, commerce, and educational institutions with the standards adopted or recognized by the Government; the construc-

tion, when necessary, of standards, their multiples and subdivisions; the testing and calibration of standard measuring apparatus; the solution of problems which arise in connection with standards; the determination of physical constants and the properties of materials, when such data are of great importance to scientific or manufacturing interests and are not to be obtained of sufficient accuracy elsewhere.

SEC. 3. That the bureau shall exercise its functions for the Government of the United States; for any State or municipal government within the United States; or for any scientific society, educational institution, firm, corporation, or individual within the United States engaged in manufacturing or other pursuits requiring the use of standards or standard measuring instruments. All requests for the services of the bureau shall be made in accordance with the rules and regulations herein established.

* * * * *

SEC. 8. For all comparisons, calibrations, tests, or investigations, except those performed for the Government of the United States or State governments within the United States, a reasonable fee shall be charged, according to a schedule submitted by the director and approved by the Secretary of Commerce.

* * * * *

The legislative, executive, and judicial appropriation act of March 4, 1915, c. 141, 38 Stat. 997, 1044, provided in part:

Bureau of Standards:

* * * * *

For investigation and standardization of methods and instruments employed in radio

communication, including personal services in the District of Columbia and in the field, $10,000.

The sundry civil appropriation act of July 1, 1916, c. 209, 39 Stat. 262, 324, provided in part:

BUREAU OF STANDARDS

* * * * *

For construction of a fireproof laboratory building to provide additional space to be used for research and testing in radio communication, and to enable the Bureau of Standards to provide space and facilities for cooperative research and experimental work in radio communication by the War, Navy, Post Office, Treasury, and other departments, and for suitable aerials, $50,000.

The urgent deficiency appropriation act of October 6, 1917, c. 79, 40 Stat. 345, 375, provided in part:

BUREAU OF STANDARDS

Radio laboratory: For additional amount for the construction of a fireproof laboratory building to provide space to be used for research and testing in radio communication, and to enable the Bureau of Standards to provide space and facilities for cooperative research and experimental work in radio communication by the War, Navy, Post Office, Treasury, and other departments, and for suitable aerials, $40,000.

The legislative, executive, and judicial appropriation act of May 29, 1920, c. 214, 41 Stat. 631, 682, 683, 684, provided in part:

Bureau of Standards:

* * * * *

For investigation and standardization of methods and instruments employed in radio

communication, including personal services in the District of Columbia and in the field, $30,000.

* * * * *

During the fiscal year 1921 the head of any department or independent establishment of the Government having funds available for scientific investigations and requiring cooperative work by the Bureau of Standards on scientific investigations within the scope of the functions of that Bureau and which it is unable to perform within the limits of its appropriations, may, with the approval of the Secretary of Commerce, transfer to the Bureau of Standards such sums as may be necessary to carry on such investigations. The Secretary of the Treasury shall transfer on the books of the Treasury Department any sums which may be authorized hereunder and such amounts shall be placed to the credit of the Bureau of Standards for the performance of work for the department or establishment from which the transfer is made.

The legislative, executive, and judicial appropriation act of March 3, 1921, c. 124, 41 Stat. 1252, 1301, provided in part:

Bureau of Standards:

* * * * *

For investigation and standardization of methods and instruments employed in radio communication, including personal services in the District of Columbia and in the field, $30,000.

The act of April 30, 1928, c. 460, 45 Stat. 467, 468, amended the provision of the act of March 3, 1883, quoted at p. 40, *supra,* to read as follows:

That so much of chapter 143 of the Act of Congress approved March 3, 1883 (Twenty-

second Statutes at Large, page 625), as relates to issue of patents without payment of any fee be, and the same is hereby, amended to read as follows:

"The Commissioner of Patents is authorized to grant, subject to existing law, to any officer, enlisted man, or employee of the Government, except officers and employees of the Patent Office, a patent for any invention of the classes mentioned in section 4886 of the Revised Statutes, without the payment of any fee when the head of the department or independent bureau certifies such invention is used or liable to be used in the public interest: *Provided,* That the applicant in his application shall state that the invention described therein, if patented, may be manufactured and used by or for the Government for governmental purposes without the payment to him of any royalty thereon, which stipulation shall be included in the patent."

The act of June 30, 1932, c. 314, Sec. 312, 47 Stat. 410, amended Section 8 of the act of March 3, 1901, p. 40, *supra,* to read as follows:

For all comparisons, calibrations, tests, or investigations, performed by the National Bureau of Standards under the provisions of this chapter, except those performed for the Government of the United States or State governments within the United States, a fee sufficient in each case to compensate the National Bureau of Standards for the entire cost of the services rendered shall be charged, according to a schedule prepared by the Director of the National Bureau of Standards and approved by the Secretary of Commerce. All moneys received from such sources shall be paid into the Treasury to the credit of miscellaneous receipts. (U. S. C. Sup. V, Title 15, Sec. 276.)

U. S. GOVERNMENT PRINTING OFFICE: 1932